

ABSTRACT

Two TE modes whose electric-field rotating planes have a perpendicular relationship are coupled independently of the coupling between two TM modes whose electric-field directions have the same respective perpendicular relationships. In a multimode dielectric resonator device producing four modes: TM_{01δ_x} mode, TM_{01δ_y} mode, TE_{01δ_x} mode, and TE_{01δ_y} mode, protrusions (Pe1), (Pe2) are disposed on an upper-layer (La) and a lower-layer of a dielectric core (1) to cause a difference in effective dielectric constants of individual parts through which even-mode and odd-mode electric flux of the TE coupling modes passes. A protrusion (Pc) is formed on a middle-layer Lb of the dielectric core (1) such that the effective dielectric constants of the parts through which even-mode and odd-mode electric flux of the TM coupling modes pass become substantially equal. Thereby, the TE_{01δ_x} mode and TE_{01δ_y} mode are coupled while restraining the coupling of the TM_{01δ_x} mode and the TM_{01δ_y} mode.

(19) 世界知的所有権機関
国際事務局

10/540758

(43) 国際公開日
2004 年 8 月 5 日 (05.08.2004)

PCT

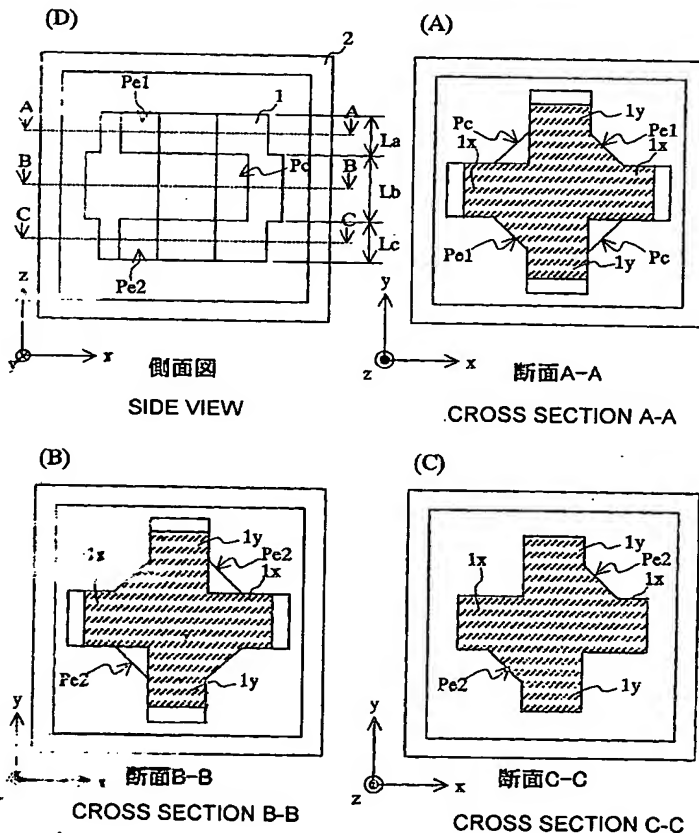
(10) 国際公開番号
WO 2004/066430 A1

- (51) 国際特許分類: H01P 1/208, 7/10 (72) 発明者; および
(21) 国際出願番号: PCT/JP2004/000409 (75) 発明者/出願人(米国についてのみ): 和田 貴也 (WADA, Takaya) [JP/JP]; 〒6178555 京都府長岡京市天神 2 丁目 2 6 番 1 0 号 株式会社 村田製作所内 Kyoto (JP). 服部 準 (HATTORI, Jun) [JP/JP]; 〒6178555 京都府長岡京市天神 2 丁目 2 6 番 1 0 号 株式会社 村田製作所内 Kyoto (JP).
(22) 国際出願日: 2004 年 1 月 20 日 (20.01.2004)
(25) 国際出願の言語: 日本語
(26) 国際公開の言語: 日本語
(30) 優先権データ: 特願2003-015906 2003 年 1 月 24 日 (24.01.2003) JP (74) 代理人: 小森 久夫 (KOMORI, Hisao); 〒5400011 大阪府大阪市中央区農人橋 1 丁目 4 番 3 4 号 Osaka (JP).
(71) 出願人(米国を除く全ての指定国について): 株式会社 村田製作所 (MURATA MANUFACTURING CO., LTD.) [JP/JP]; 〒6178555 京都府長岡京市天神 2 丁目 2 6 番 1 0 号 Kyoto (JP). (81) 指定国(表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA,

[続葉有]

(54) Title: MULTIMODE DIELECTRIC RESONATOR DEVICE, DIELECTRIC FILTER COMPOSITE DIELECTRIC FILTER, AND COMMUNICATION DEVICE

(54) 発明の名称: 多重モード誘電体共振器装置、誘電体フィルタ、複合誘電体フィルタおよび通信装置



(57) Abstract: Two TE modes the electric fields of which rotates on mutually perpendicular planes are coupled independently of the coupling of two TM modes the electric fields of which are oriented in the directions in the same perpendicularity relation of the TE modes. A multimode dielectric resonator device have four modes: TM01 δ -x mode, TM01 δ -y mode, TE01 δ -x mode, and TE01 δ -y mode. Protrusion portions (Pe1, Pe2) are provided to upper and lower layer portions (La, Lc) of a dielectric core (1). Therefore, the effective dielectric constant of the portion where the dielectric flux of the even mode of the TE coupling modes passes is made different from that of the portion where the dielectric flux of the odd mode of the TE coupling modes passes. A protrusion portion (Pc) is provided to an intermediate layer portion (Lb) of the dielectric core (1). Therefore, the effective dielectric constant of the portion where the dielectric flux of the even mode the TM coupling modes passes is almost equal to that of the portion where the dielectric flux of the odd mode of the TM coupling modes passes. Thus, while suppressing the coupling between the TM01 δ -x mode and the TM01 δ -y mode, the coupling of the TE01 δ -x mode and TE01 δ -y mode is established.